

System 5 Control Surface/Frame

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TABLE OF CONTENTS

Box Inventory.....	4
Safety and Precautions.....	4
Power On Sequence	5
CE/TUV/UL/CSA.....	5
Component Overview.....	6
Functional Description	6
FRAME SECTION	7
Physical Specifications	7
Exploded View	7
Side Panel View	8
Dimensions and Weight	9
User Reference - Frame	10
Assembling the S5 Frame	10
System 5 Ethernet/Power Cable Configuration	17
System 5 Ethernet Cable Harness.....	18
CONTROL MODULES SECTION.....	20
Physical Specifications.....	20
Top View - Control Modules.....	20
Filler Modules	21
Dimensions and Weight	22
Technical Specifications.....	22
Environmental Requirements	22
Power Requirements	22
Power Consumption	22
Control Module Expansion Port	23
General Description.....	23
Physical Pinout	23
DB25 Electrical Specification:	25
Typical Usage:.....	25
Alternate Usage #1.....	26
Alternate Usage #2:.....	27
User Reference – Control Modules	28
Control Module Setup.....	28
Overview of Ethernet IP Address Allocation.....	28
Self Test Procedure for CM401, CM402 and CM408	29
Initiating Self Test.....	30
Self Test Operations.....	31
Top Level Test Keys.....	32
LED test.....	33
All Switch LEDs Toggle	34
Color Toggle	34
All Switch and Indicator LEDs Toggle	34
Vegas Mode	34

Switch Test	35
Intelligent Display Test	36
Knob Test	37
Knob value display	38
Halo Test	38
Knob meter display	38
Knob switch test	38
Expansion port switch test	38
Fader Test	39
Fader Test (continued)	40
All fader up	41
All fader down	41
Fader cycle test with speed control	41
Fader echo test	41
Touch Sense Test	41
Backstop PFL switch test	41
Fader Write value display	41
Fader Read value display	41
TFT backlight brightness test	41
CPU Test	42
RAM Test	42
ROM Test	42
PC104 RAM Test	43
APPENDIX 1	45
Parts Lists	45
System 5 Leg Set: Part# 946-07220-01	45
System 5 Frame Set, 6ft: Part# 946-06425-01	47
System 5 Frame Set, 9ft: Part# 946-06840-01	48
System 5 Frame Set, 12ft: Part# 946-07160-01	49

Box Inventory

Description	Part #	Qty
S5 Leg Set	946-07220-01	
Leg, Left, Finished	726-06398-01	1
Leg, Right, Finished	726-06419-01	1
Keyboard Tray Assembly	726-06415-01	1
Keyboard Palm Rest	726-07216-01	1
S5 Control Surface/Frame Manual	840-07576-01	1
One of the following Frame Kits		
Frame, 6ft	946-06425-01	
Frame, 9ft	946-06840-01	
Frame, 12ft	946-07160-01	
The specified number of the following modules:		
CM401	946-05718-01	
CM402	946-05719-01	
CM408	946-05717-01	
CM409-HTP	946-07000-01	
Serial Mouse Extender	032-07169-00	
CM409-H	946-06650-01	
CM409-F	946-06651-01	

Safety and Precautions

- 1) Read Instructions - Read all the safety and operation instructions before operating the System 5 Control Surface.
- 2) Heed Warnings – Follow all warnings on the Control Modules and in these operating instructions.
- 3) Water and Moisture – Do not use the Control Surface near water.
- 4) Heat – Locate the Control Surface away from heat sources.
- 5) Power Sources – Connect the Control Modules only to a power supply of the type described in these operation instructions or as marked on the Control Modules.
- 6) Power Cord Protection – Route power cords so that they are not likely to be walked upon or pinched by items placed on them.
- 7) Object and Liquid Entry – Do not drop objects or spill liquids on the Control Surface.
- 8) Damage Requiring Service – The Control Modules should be serviced only by qualified personnel when:
 - a) Objects have fallen, or liquid has spilled into the Control Modules; or
 - b) A Control Module does not appear to operate or exhibits a marked change in performance; or,
 - c) A Control Module has been dropped or sustained other physical damage.

- 7) Servicing – Do not attempt to service the Control Modules beyond those means described in this operation manual. All other servicing should be referred to the Euphonix Tech Support department.
- 8) Fuse replacement – To prevent electric shock and avoid risk of fire, replace fuse only with the same type and rating.
- 9) To prevent electric shock, do not use the Control Modules polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.
- 10) Grounding or Polarization – Do not defeat the grounding or polarization of the Control Modules.

Power On Sequence

The Control Surface modules are powered up by a switch on the back of the frame. The Control Surface should be powered up after the Virtual Mixer is running.

CE/TUV/UL/CSA

CE documentation is available.

Component Overview

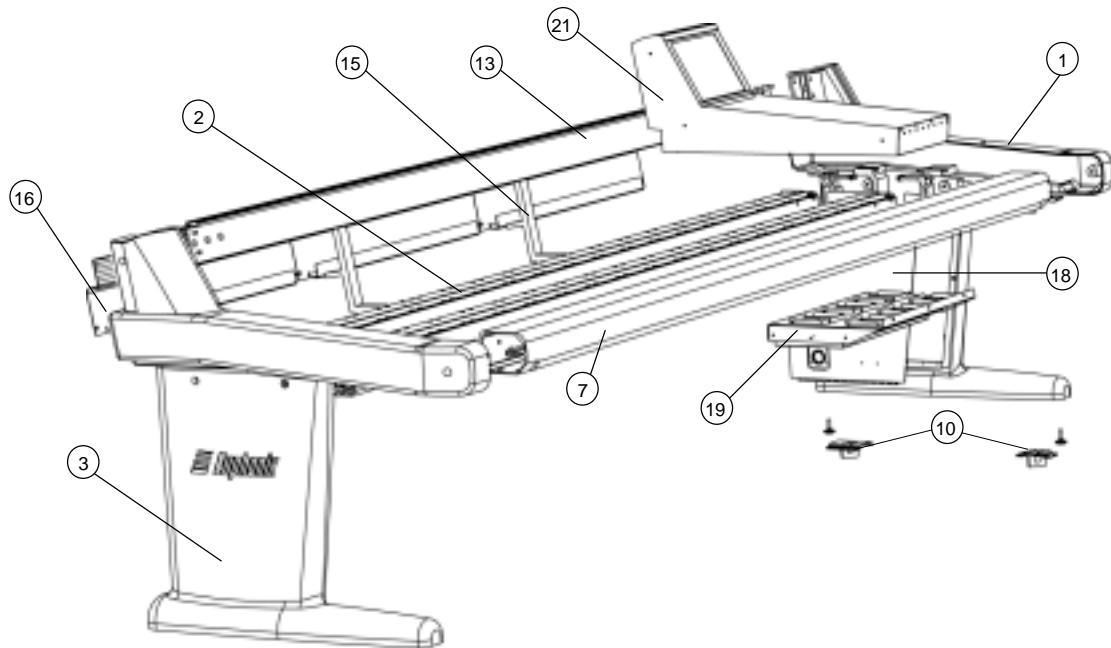
Functional Description

The System 5 Console consists of a frame and leg assemblies which house a configurable number of Control Modules that comprise the Control Surface. The System 5 Control Surface is the digital control center for all the System 5 component assemblies. The Control Surface communicates with the System 5 component assemblies via Ethernet network connections. Control signals are transmitted to the Euphonix EH224 EuCon Hub and distributed to the various System 5 component assemblies. No audio passes through the Control Surface.

Available in 6 foot, 9 foot, and 12 foot frame widths, the System 5 Control Surface is modular in construction. The number and variety of Control Modules are configurable based on the specific needs of each facility. Control modules are 12 inches wide. Filler modules can be ordered in full or half width.

FRAME SECTION

Physical Specifications

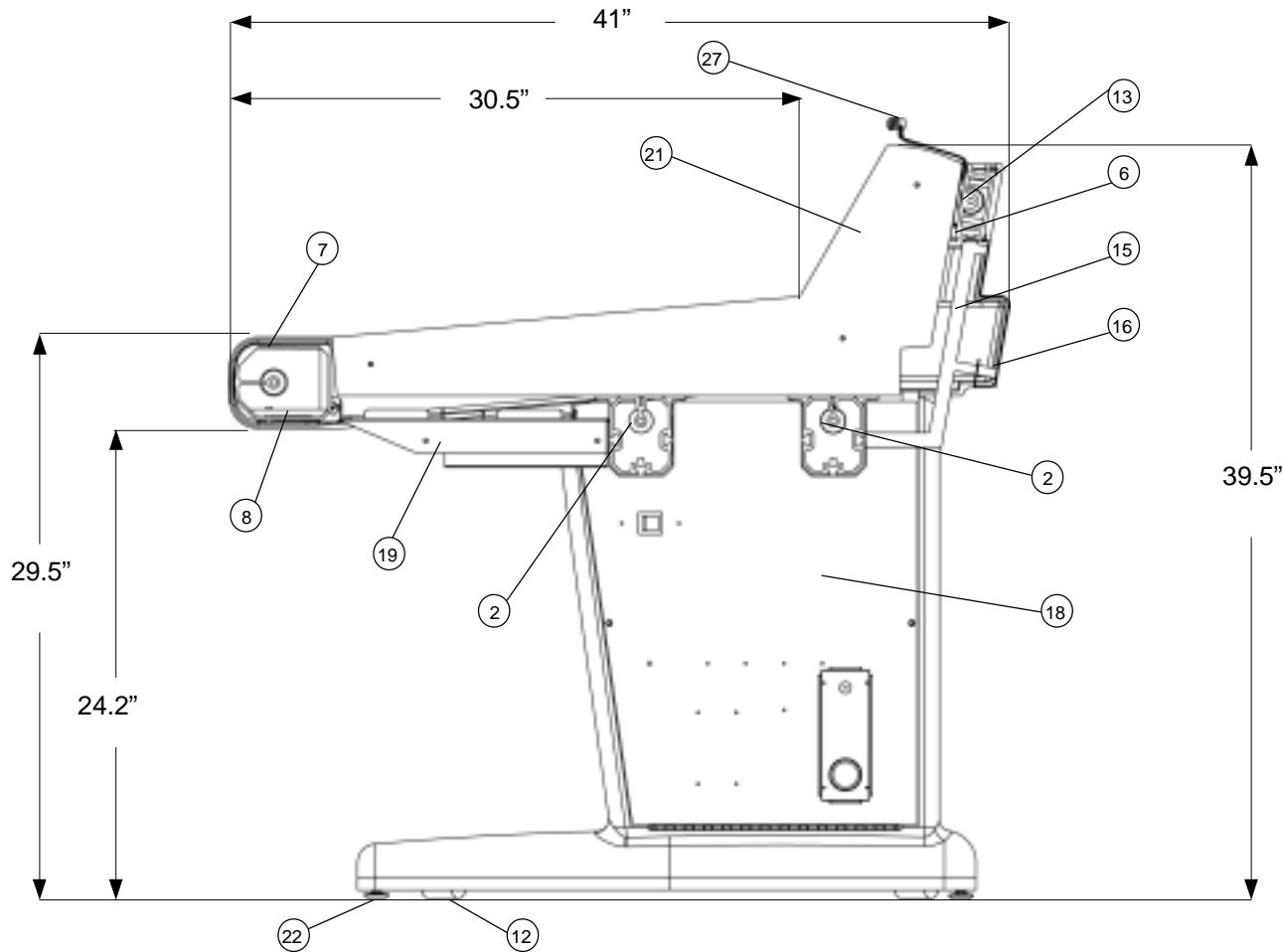


Exploded View

Item No.	Qty	Description	Part No. 6ft	Part No. 9ft	Part No. 12ft
1	1	Leg, Right, Finished		726-06419-01	
2	2	Box beam	726-06399-01	726-06437-01	726-07164-01
3	1	Leg, Left, Finished		726-06398-01	
7	1	Palm beam		726-06415-01	
10	4	Caster Brackets			
13	1	Back beam-9	726-06408-01	726-06430-01	726-07163-01
15	2	Brace 1		726-06404-01	
16	3	Cover, back, 3ft	726-06686-01 (1)	726-06686-01 (2)	726-06686-01 (3)
18	1	Leg panel	Left - 726-06394-01	Right - 726-06826-01	
19	1	Keyboard Tray Assy		726-06415-01	
21	1	CM401 assembly		946-05718-01	
21	*	CM402 assembly		946-05719-01	
21	*	CM408 assembly		946-05717-01	
21	*	CM409F assembly		946-06651-01	
21	*	CM409H assembly		946-06650-01	

* Qty depends on specified configuration

Side Panel View



Item No.	Qty	Description	Part No. 6ft	Part No. 9ft	Part No. 12ft
2	2	Box Beam	726-06399-01	726-06437-01	726-07164-01
6	1	Plate, compression		726-06402-01	
7	2	Palm Beam	726-0403-01	726-07168-01	726-07162-01
8	1	Plate, spread		726-06404-01	
12	4	Caster		726-06407-01	
13	1	Back beam	726-06408-01	726-06430-01	726-07163-01
15	2	Brace	726-06411-01		
16	*	Cover, back, 3ft	726-06686-01 (2)	726-06686-01 (3)	726-06686-01 (4)
18	2	Leg Panel	726-06394-01 (Left)	726-06826-01 (Right)	
19	1	Keyboard Tray Assy		726-06415-01	
21	1	CM401 assembly		946-05718-01	
21	*	CM402 assembly		946-05719-01	
21	*	CM408 assembly		946-05717-01	
21	*	CM409F assembly		946-06651-01	
21	*	CM409H assembly		946-06650-01	
22	4	Foot, level		000-06434-00	
27	1	Talk Back Mic		302-07044-00	

* Qty depends on specified configuration

Dimensions and Weight

Height: 39.5 inches

Width: Frame size + 10"

Depth: 41 inches

Weight: Frame without modules

6ft Frame: 245lbs (111kg)

9ft Frame: 300lbs (136kg)

12ft Frame: 380lbs (172kg)

Approximately 14 inches of depth should be left behind the System 5 Control Surface for cable connections.

User Reference - Frame

Assembling the S5 Frame

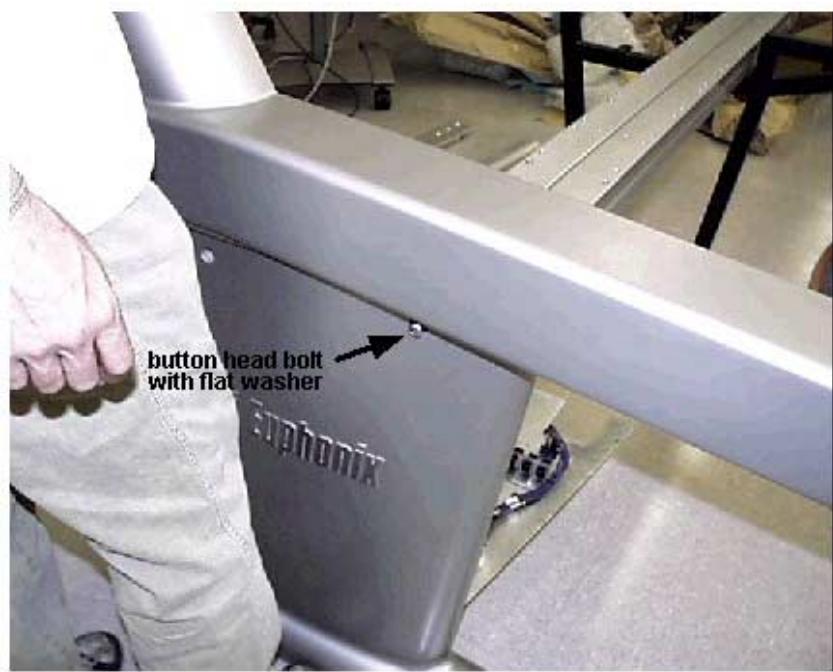
Tools required:

- Hex drivers, 1/8", 3/16", 7/32", 1/4", 5/32"
- Flat-bladed screwdriver, 1/4"
- Socket wrench, 1/2"
- Silicon grease for bolts (Finish Line bicycle grease works great)
- Aux leg (item 20, not shown on some frame drawings)
- Bus wire, two 24" pieces
- Tap set for 3/8" 24 (3/8" 16 for newer box beams) and 5/16 18 threads

Minimum number of people required: 2. For a 12-foot frame, 3 people are required.

Refer to the System 5 Frame drawings (pages 7-8) and the Parts Lists at the end of this manual to help with parts identification and visualization of the steps set forth in this procedure.

- 1) Verify that all screws and bolts have been greased. If they aren't greased, apply silicon grease to all of them.
- 2) Start with inserting the middle box beam (item 2) in the left leg (item 3, Leg Left). You may have to drop the leg panel (item 18, legpnl) to get it in easily. Two people need to hold up the beam, while the third person holds up the leg. Guide the beam into the leg (flat side up). Insert a 3/8" 24x1.5 button head bolt (046-06421-00) with a 3/8" flat washer (081-07193-00) through the leg hole and into the beam, being careful not to strip the threads. Tighten the bolt fully, using a 7/32" hex driver.



3) After the beam is attached to the leg, the auxiliary leg (12 ft frame only, item 20) can be put underneath the beam near the center to hold it up. Secure the auxiliary leg to the beam by inserting a "T" nut (000-06690-00) into the beam, and thread a 5/16x18x0.50 screw (044-07192-00) through the auxiliary leg mounting hole and into the "T" nut.

4) Insert the rear box beam (item 2) into the left leg next, using the same techniques outlined in step



2. The auxiliary leg can help to hold up the beam.



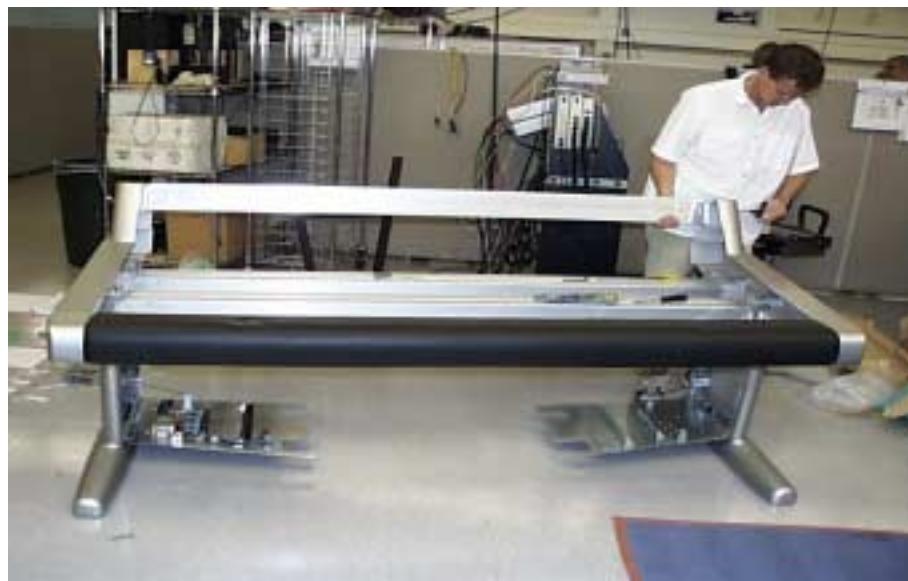
5) Prior to inserting the palm beam (item 7) into the left leg, thread the bus wire through one of the holes of the spread plate (part#726-06404-01, item 8), twist-locking the wire at the spread plate end. Run the other end of the wire through its matching bolt hole on the left end of the palm beam. The spread plate should mount inside the end of the palm beam, flat side up. As the palm beam is inserted into the left leg (rounded side out) guide the bus wire into the matching bolt hole of the leg. Insert a 3/8" 24x1.5 button head bolt through the leg hole and into the beam, using the same techniques outlined in step 1. The auxiliary leg can help to hold up the beam.

6) Insert the back beam (item 13) into the left leg, using the same techniques outlined in step 1. The



auxiliary leg can help to hold up the beam.

- 7) Insert as many "T" nuts in the beams as required. For example, you will need 3 "T" nuts for the middle box beam's inner channel and 3 "T" nuts for the palm beam's inner channel in order to install the keyboard tray. You will need 4 "T" nuts for each back cover brace (item 15, brace 1), 2 for the back beam bottom channel and 2 for the rear box beam outside channel. You will need 2 "T" nuts for each power strip, usually mounted on the rear box beam.
- 8) With the auxiliary leg holding up one end of the S5 frame, insert the four beams into the right leg (item 1, Leg Right), using the same techniques outlined in step 1. Also, for the palm beam, use



the same technique with the spread plate and bus wire as outlined in step 4.

- 9) Install the four box beam braces (item 4) on each end of the box beams. Use four 5/16-18x3.5 bolts (043-06688-00) and four 5/16 lock washers (082-066889-00) for each box beam brace. Use a 1/2" socket wrench. Do not tighten down fully until the frame is fully loaded and its width is



checked.

- 10) To secure the spread plates into the palm beam ends, pull down on the bus wire, and line up the spread plate screw holes with the leg screw holes. With a 3/16" hex driver, insert a 5/16-18x1.125 flathead screw (046-06409-00) into spread plate screw hole sans the bus wire. Once the screw is threaded in and tightened down, remove the bus wire and insert the other countersunk screw in the screw hole that the bus wire previously occupied. You may have to loosen the other screw a little in order to remove the bus wire.
- 11) Using the 3/16" hex driver and 5/16-18x2.25 flathead screws (046-06401-00), install the spread plates (part# 726-06402-01, items 5 & 6) into the back beam ends. (Like spread plate pictured in Step 5.)
- 12) Install all the modules into the frame to ensure that their surfaces are flush. Use the thumbscrews (936-07240-01, S5 thumbscrew kit, 4 per module) to secure the modules to the box beams. Before installing the 401 module permanently into the frame, attach the talkback mic bracket (936-07219-01, S5 talkback mic kit) into the middle top screw hole of the SBC panel, using the screw and insulating washer supplied in the S5 talkback mic kit.
- 13) After verifying that the control surface is acceptable, tighten all loose screws and bolts in the frame. Tighten the bolts on the box beam braces only until their lock washers flatten, and no further. You will have to temporarily remove the modules on each end of the frame to be able to tighten the box beam braces.
- 14) Using a 1/4" hex driver and 5/16x18x0.375 socket head screws (044-06686-00), install the back cover braces (item 15, brace 1). Determine the position of the braces by aligning them with the back cover mounting screw holes. Move the slide nuts in the rear box beam and back beam to the brace locations, and mount the braces to them.

15) Using a 5/32" hex driver and 1/4x20/3/8 button head screws (044-07236-00), install the back covers on the braces.



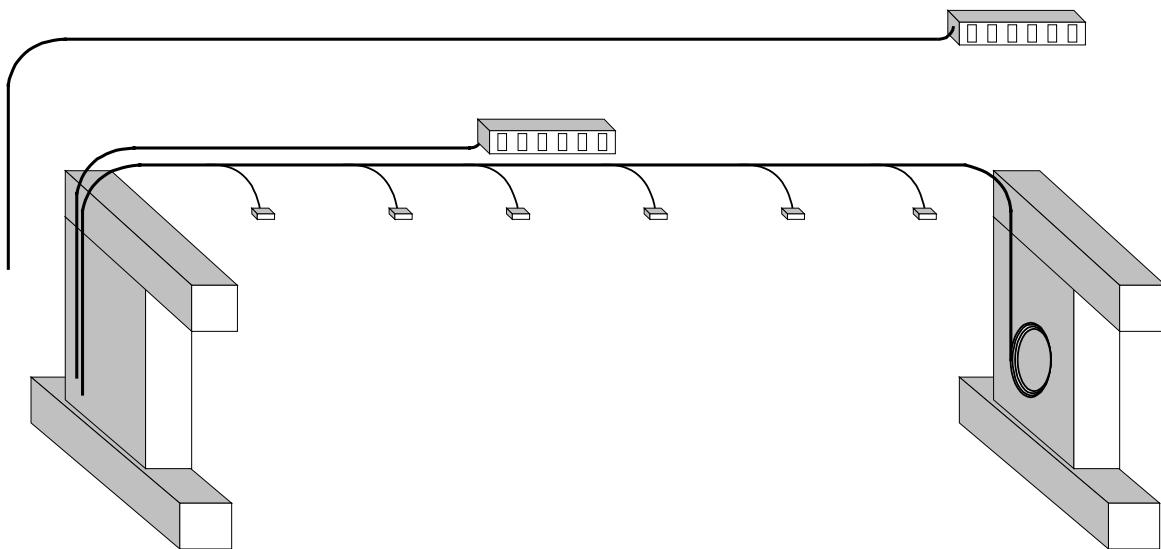
16) Determine where the power strips (part#600-07223-00) are going to be mounted on the rear box beam, line up the slide nuts in the box beam to match the mounting holes of the power strips, and use a 1/4" hex driver with 5/16x18x0.375 socket head screws to mount the power strips into the slide nuts.

17) Determine where the keyboard drawer (item 19, kbd drawer) is going to be located, then line up the slide nuts in both box beams (the distance between the screw holes on each box beam end of the keyboard drawer is xx"). Use a 1/4" hex driver with 5/16x18x0.375 socket head screws to mount the drawer into the slide nuts.

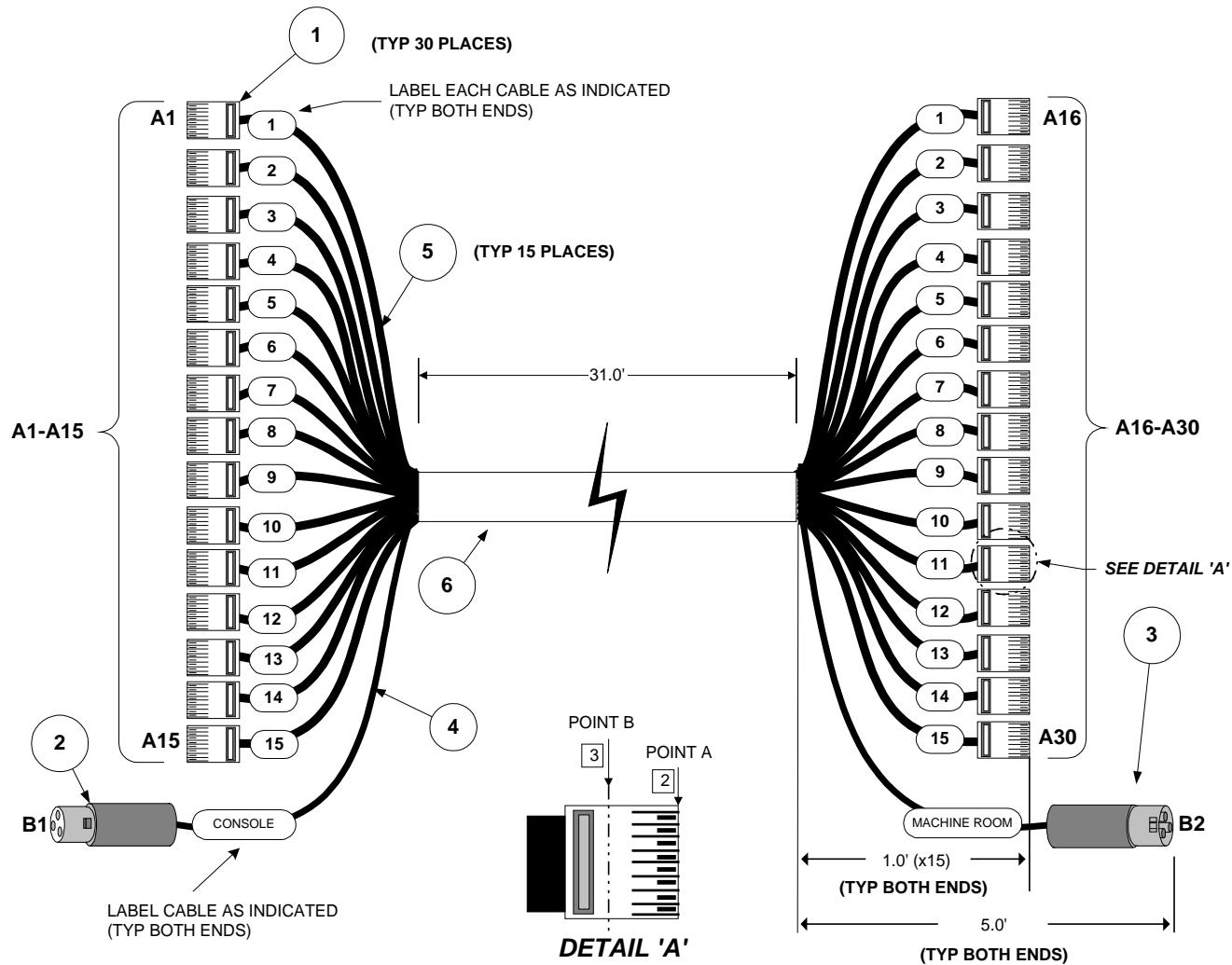


- 18) If the network, power, and talkback mic cables are not going to enter the S5 frame from the bottom of a leg, then the leg panel supporting the cabling will have to have its knockout plate removed. Remove the leg panel from the leg before punching. The punch direction should be from the outside to the inside. Support the knockout hole on the inside of the leg panel with a roll of duct tape, or something similar. This will alleviate any distortion to the leg panel metal while punching.

System 5 Ethernet/Power Cable Configuration



System 5 Ethernet Cable Harness



CONNECTOR MATING	A1-A30 WIRE LIST			B1-B2 WIRE LIST			
	A1-A15	A16-A30	WIRE COLOR	B1	B2	WIRE	SIGNAL
A1-A16	PIN 1	PIN 1	WHT/ORG	1	1	DRAIN	GND
A2-A17	PIN 2	PIN 2	ORG	2	2	WHITE	HOT
A3-A18	PIN 3	PIN 3	WHT/GRN	3	3	BLACK	COLD
A4-A19	PIN 4	PIN 4	BLU				
A5-A20	PIN 5	PIN 5	WHT/BLU				
A6-A21	PIN 6	PIN 6	GRN				
A7-A22	PIN 7	PIN 7	WHT/BRN				
A8-A23	PIN 8	PIN 8	BRN				
CABLE ASSEMBLY PARTS LIST							
ITEM	QTY	MFR	MFR P/N	DESCRIPTION			
A11-A26	30	PHYCO	1001-8P8CSR	RJ45 PLUG, 8-8, RND SLD			
A12-A27	1	NEUTRIK	NC3FX	XLR 3PIN FEMALE CABLE CONNECTOR			
A13-A28	1	NEUTRIK	NC3MX	XLR 3PIN MALE CABLE CONNECTOR			
A14-A29	1	GEPCO	MP1022 BLACK	2 LEAD SHIELDED CABLE, 24AWG			
A15-A30	41'	BELDEN	MEDIA TWIST 350(1872A)BLUE	4 PAIR UTP CABLE, 24AWG SOLID COPPER			
B1-B2	495'	TECHFLEX	CCPT6X	EXPANDABLE SLEEVING			
	31'						

Notes:

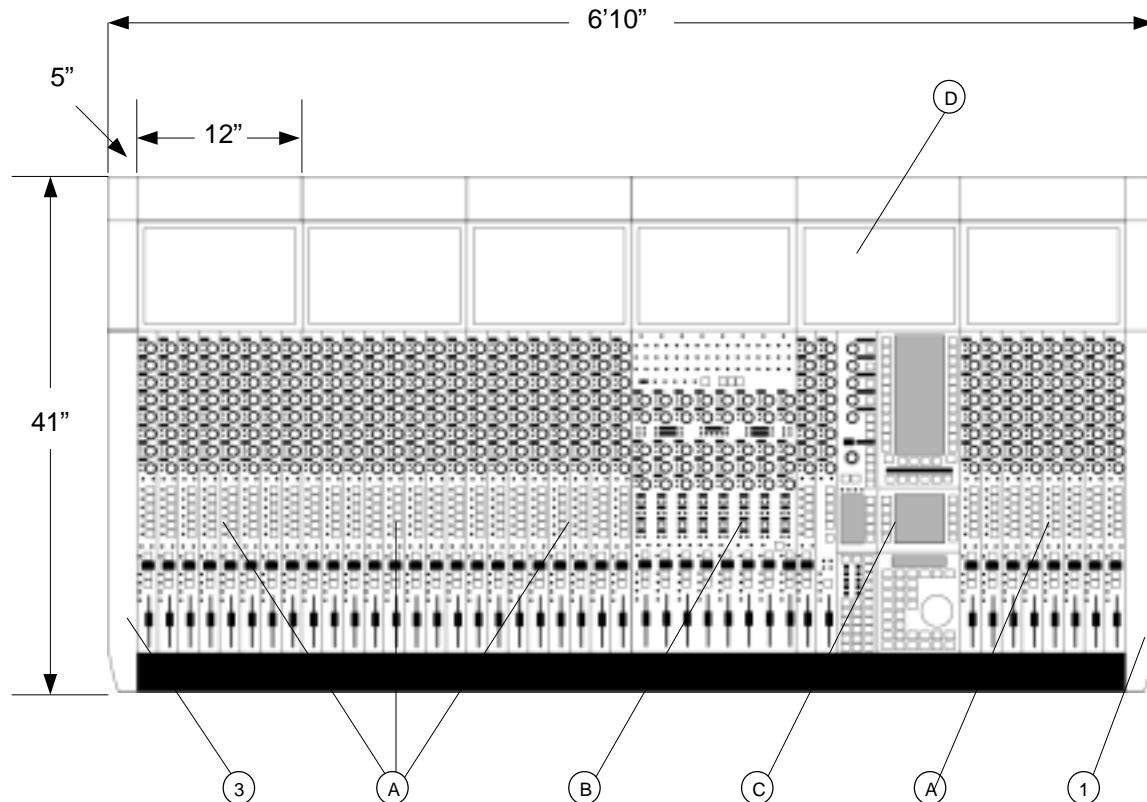
1. All dimensions are in feet
2. Make sure that all wire ends are flush with "Point A". Typical 30 places
3. Make sure that the insulation jacket of the cable reaches to "Point B" when crimping terminal. Typical 2 places. Cable ends are to be terminated according to TIA/EIA 568b standards.

CONTROL MODULE SECTION

CONTROL MODULES SECTION

Physical Specifications

Top View - Control Modules



Frames are available in 6ft, 9ft, and 12ft sizes. Actual width of Control Surface is frame size + 10 inches.

Item No.	Qty	Description	Part No.
A	*	CM408 Control Module	946-05717-01
B	*	CM402 Control Module	946-05719-01
C	1	CM401 Control Module	946-05718-01
D	*	TFT Display	Inc. in CM Module
1	1	Leg, right	726-06419-01
3	1	Leg, left	726-06398-01

* Qty depends on specified configuration

Filler Modules



CM409F



CM409H



CM409HTP

CM409F- This is the full-wide blank module for S5 Control surfaces. It can be placed anywhere within the control surface to fill up the frame. It provides a working surface for remote controls, keyboards, etc. Order part# 946-06651-01.

CM409H- This module is a half-wide blank module for S5 Control surfaces. It module is similar to a CM409F but only half the width. Order part# 946-06650-01.

CM409HTP- This module is a half-wide Track Panner. It is the same width as the CM409H. The CM409HTP contains a high quality track ball for panning and two switches for Pan Select/Punch and Channel Pan Function. Order part# 946-07000-01.

Dimensions and Weight

Module	Weight	Width
CM401:	35lbs (16kg)	12"
CM402:	35lbs (16kg)	12"
CM408:	35lbs (16kg)	12"
CM409F:	16lbs (7kg)	12"
CM409H:	9lbs (4kg)	6"
CM409HTP:	10lbs (4.5kg)	6"

Approximately 14 inches of depth should be left behind the System 5 Control Surface for cable connections.

Technical Specifications

Environmental Requirements

Environmental requirements for the System 5 Control Modules are as follows:

Operating Temperature:	0 to 40 degrees Celsius (ambient)
Storage Temperature:	-10 to 55 degrees Celsius
Humidity:	0 to 90% non-condensing

Power Requirements

90 to 254 Volts AC (rms), 50/60Hz, 150 Watts per module.

Power Consumption

Power consumption of the Control Surface Modules is shown in the table below.

Individual Module Power Consumption			
Module	US (117V)	Europe (230V)	Japan (100V)
CM401	1.0A	.5A	1.0A
CM402	1.0A	.5A	1.0A
CM408	1.0A	.5A	1.0A

- Inrush current : 25 Amps
- Fuse Rating: 5Amp Slo-Blo or Time Delay

Control Module Expansion Port

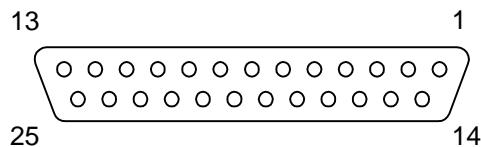
General Description

On the back of each System 5 Control Module (CM401, CM402, and CM408,) is a DB25 Euphonix Expansion Port. This port is a hardware interface to external devices, and supports 8 switch inputs and 8 LED/relay drive outputs. This document describes the pinout and typical usage of this port.

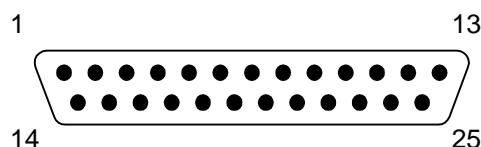
Physical Pinout

The Expansion Port on the module is a DB25 female connector. A DB25 male cable needs to be built to interface to this port (pictured below). The pinout has been configured for easy interface to the Euphonix GP132 box, and is as shown on the following page:

Looking into the **FEMALE** connector on the module:



Looking into a **MALE** cable connector:



Pin #	Signal
1	LED 1 output (active low)
2	Switch 1 input (active high)
3	+5V
4	LED 3 output (active low)
5	Switch 3 input (active high)
6	+5V
7	LED 5 output (active low)
8	Switch 5 input (active high)
9	+5V
10	LED 7 output (active low)
11	Switch 7 input (active high)
12	+5V
13	+5V
14	+5V
15	LED 2 output (active low)
16	Switch 2 input (active high)
17	+5V
18	LED 4 output (active low)
19	Switch 4 input (active high)
20	+5V
21	LED 6 output (active low)
22	Switch 6 input (active high)
23	+5V
24	LED 8 output (active low)
25	Switch 8 input (active high)

DB25 Electrical Specification:

The +5V output on the connector is protected internally by a 200mA self-resetting fuse. If LED drive outputs are used, it is recommended that several +5V connections be used to drive the anodes of the LED's (at least one +5V wire per LED used). The active-low LED drive outputs are current limited by internal 110 ohm series resistors, and are capable of sinking 20mA each. The active-high switch inputs are TTL-level inputs with 100K pull-down resistors.

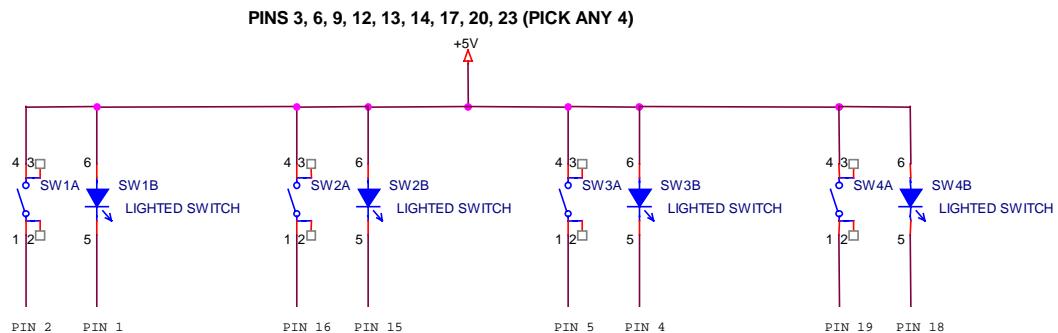
Typical Usage:

Currently, the software supports remote talkback switching and status on Switch inputs 1-4 and LED outputs 1-4 **on the CM401 Expansion Port only**. Functionality is as follows:

Function	Triggered by	Status shown on
Talkback → Mon A	Switch 1 input (momentary)	LED 1 output
Talkback → Mon B	Switch 2 input (momentary)	LED 2 output
Talkback → Mon C	Switch 3 input (momentary)	LED 3 output
Talkback → Mon D	Switch 4 input (momentary)	LED 4 output

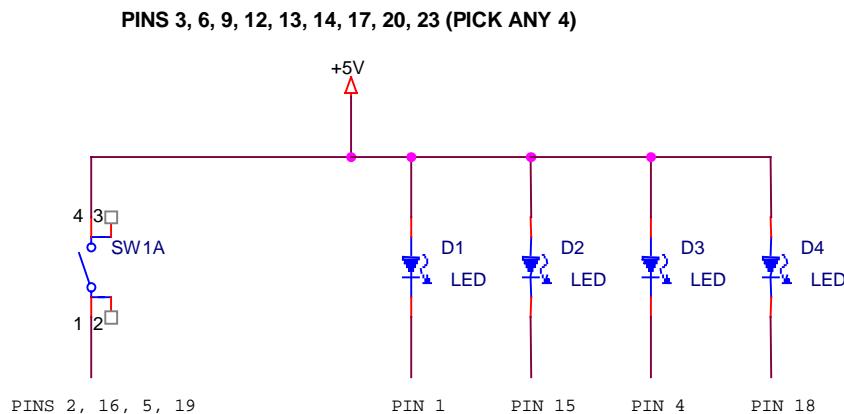
For example, while Switch 1 is pressed down, the Talkback mic signal will be routed to the Mon A output, and LED 1 will light during the time that the switch is pressed down. Also, if Talkback → Mon A is activated from the console itself, LED 1 will also light, to indicate the status.

Pressing SW1A routes the Talkback signal to Mon A, and the SW1B LED lights to indicate the Talkback→Mon A status.



Alternate Usage #1:

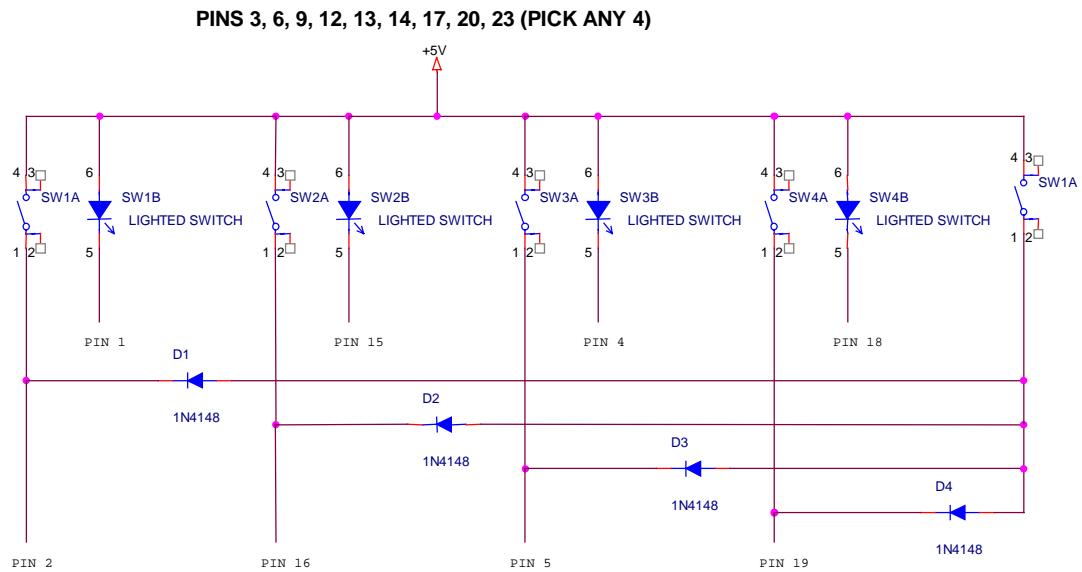
Another way of using these talkback inputs/outputs would be to have one switch activate more than one talkback function. For example, a single switch can route the Talkback signal to all four monitor outputs:



Pushing SW1A routes the Talkback signal to all four monitor outputs, and LED's D1-D4 indicate the Talkback → Mon A-D status.

Alternate Usage #2:

Another implementation combines the above two approaches – we have individual Talkback enable buttons like in the Typical Usage, but we've added an 'OMNI' switch that routes the Talkback signal to all four monitor outputs:



User Reference – Control Modules

Control Module Setup

Overview of Ethernet IP Address Allocation

Computers				
Computer	IP Address	Pilot ID	Frame ID	Module ID
System Computer	192.168.0.1	N/A	N/A	
Digital Pilot	192.168.0.200	1	N/A	0
	192.168.0.201	2	N/A	1
	192.168.0.202	3	N/A	2
	192.168.0.203	4	N/A	3
Interface Pilot	192.168.0.215	15	N/A	15

Control Modules			
Module	IP Address	Frame ID	Module ID
CM401	192.168.0.24	IL	15
CM402	192.168.0.25	IL	16
CM408	192.168.0.10	IL	1
	192.168.0.11	IL	2
	192.168.0.12	IL	3
	192.168.0.13	IL	4
	192.168.0.14	IL	5
	192.168.0.15	IL	6
	192.168.0.16	IL	7
	192.168.0.17	IL	8
	192.168.0.18	IL	9

Self Test Procedure for CM401, CM402 and CM408

(For CM40x Firmware Rev 1.0S)

The following pages describe the operation of standalone self test software for System-5 control modules.

The self-test code is designed to be invoked in a module right after power-up and before the SBC downloads code into the control module 386 board.

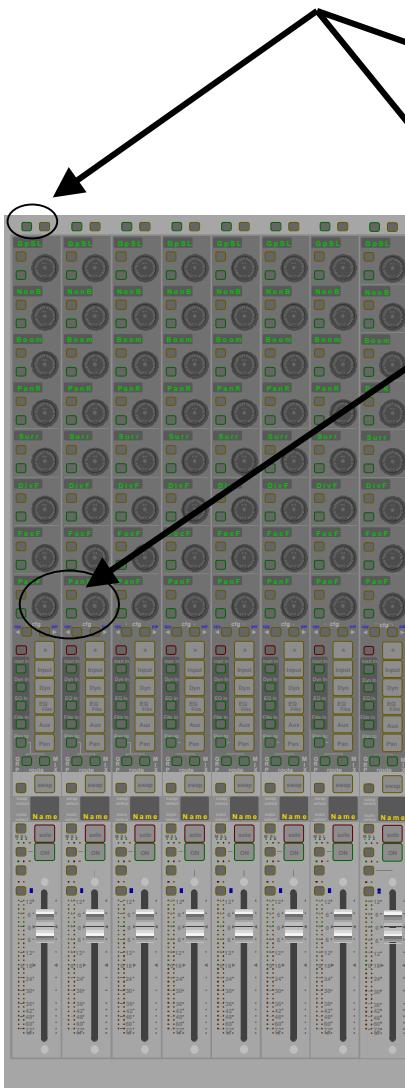
The self-test works in a fully assembled module as well as with just the upper board or just the lower board connected to the CPU board. However, the upper board must be present to run fader test modes.

All the three types of control modules have the same lower board. Because of this, the lower board can be tested separately without an upper board connected. The self-test can be invoked from the lower board knobs as well as upper board self test keys.

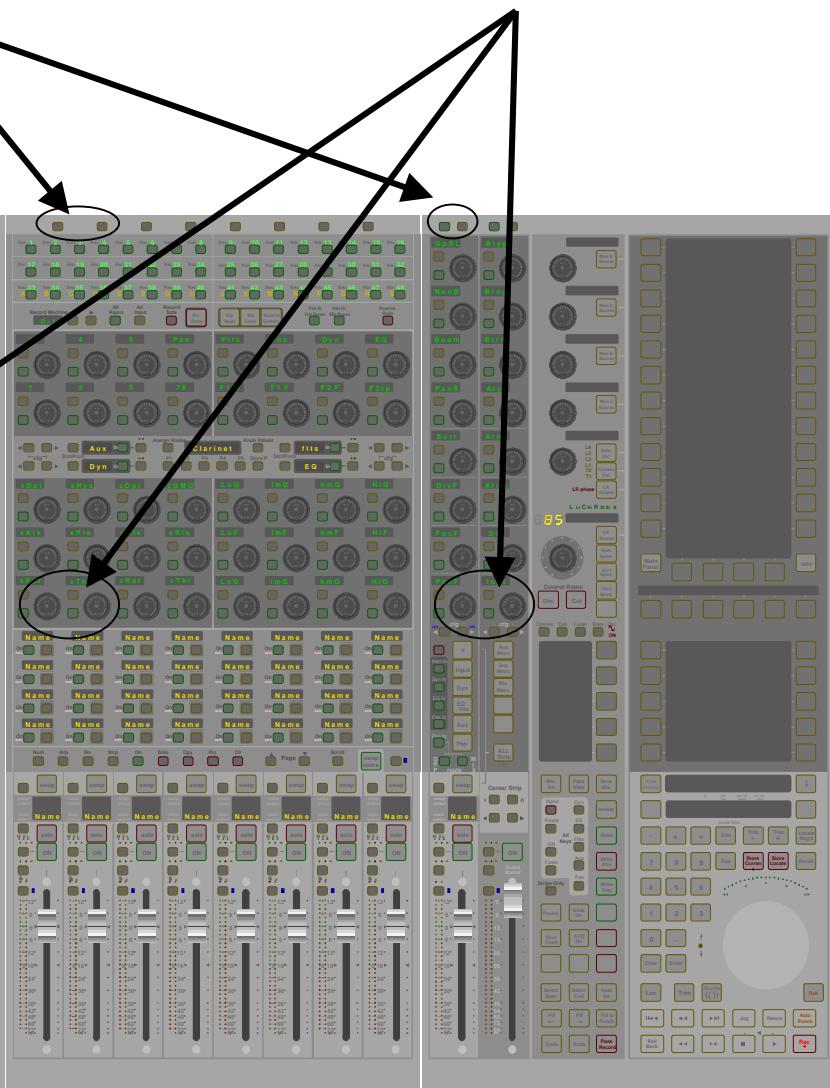
Initiating Self Test

Enter self-test by pressing the self-test enter keys shown below. This must be done before the SBC code download. If code download from the SBC happens during self-test, then the module will automatically exit self-test and execute downloaded code.

Enter Self-Test
Press both keys



Enter Self-Test
Press both Knob Switches



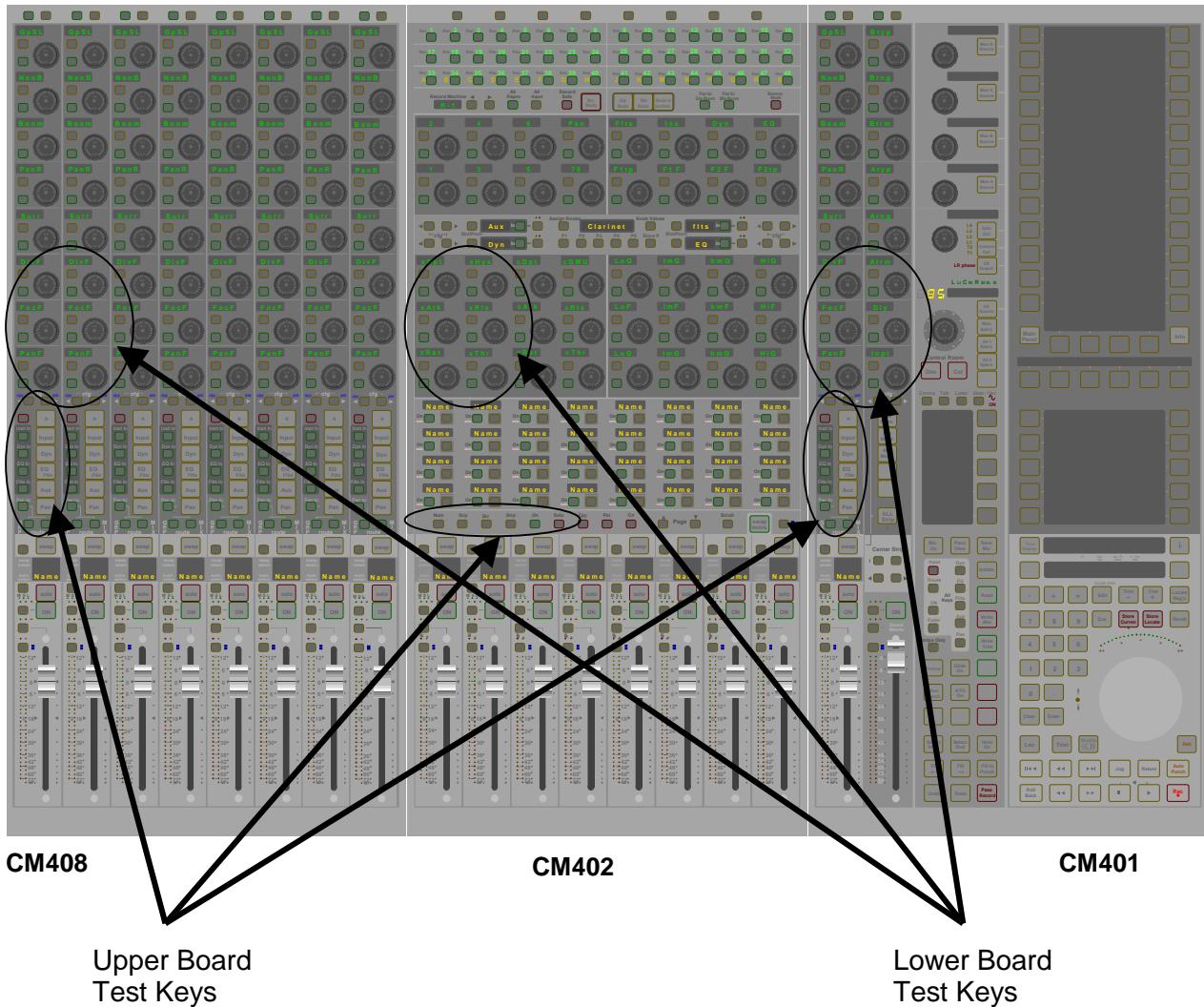
CM408

CM402

CM401

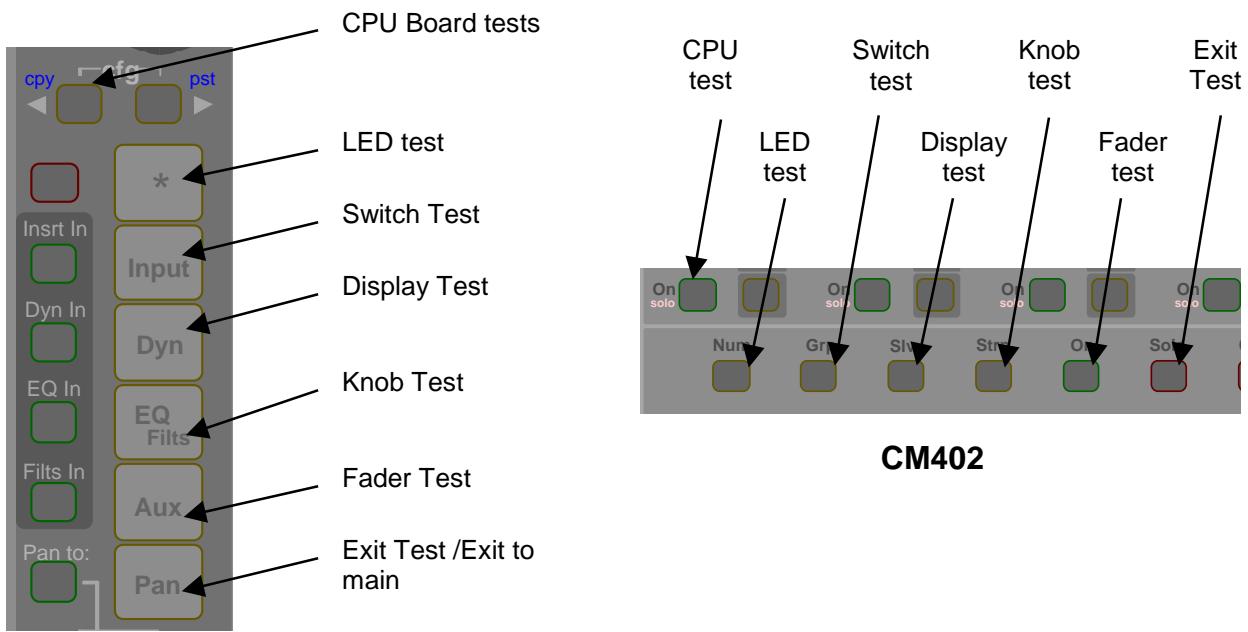
Self Test Operations

The operation of each key on the upper and lower board is described in this document.

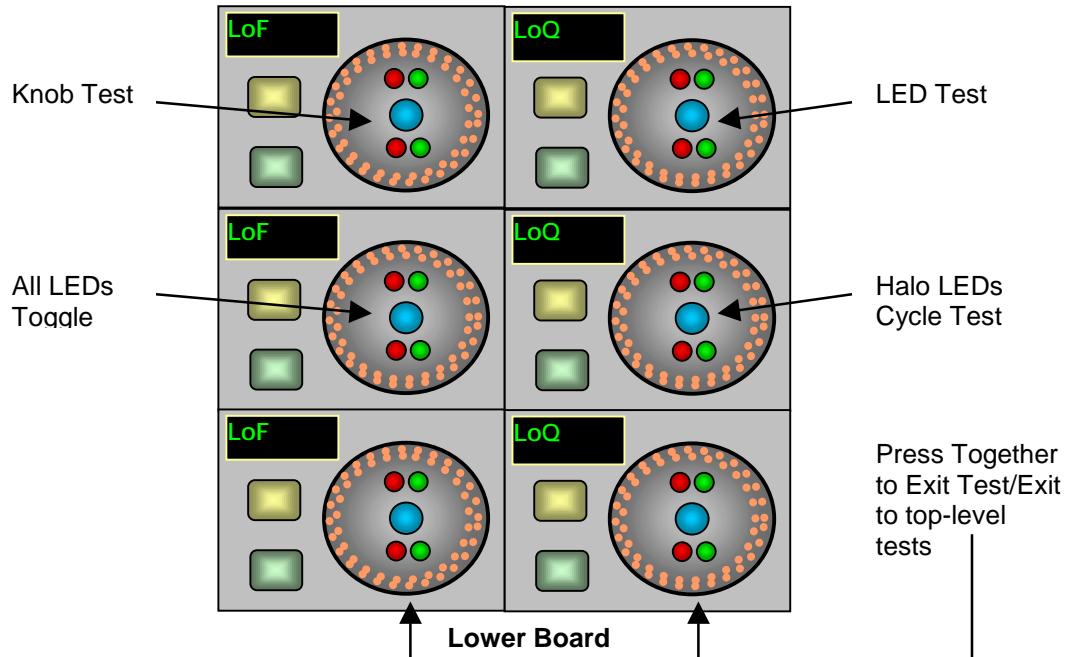


Top Level Test Keys

To enter the 6 different tests, use the keys shown below. After entering the test, use the detailed description of each test on the following pages to navigate through different test modes within a test.



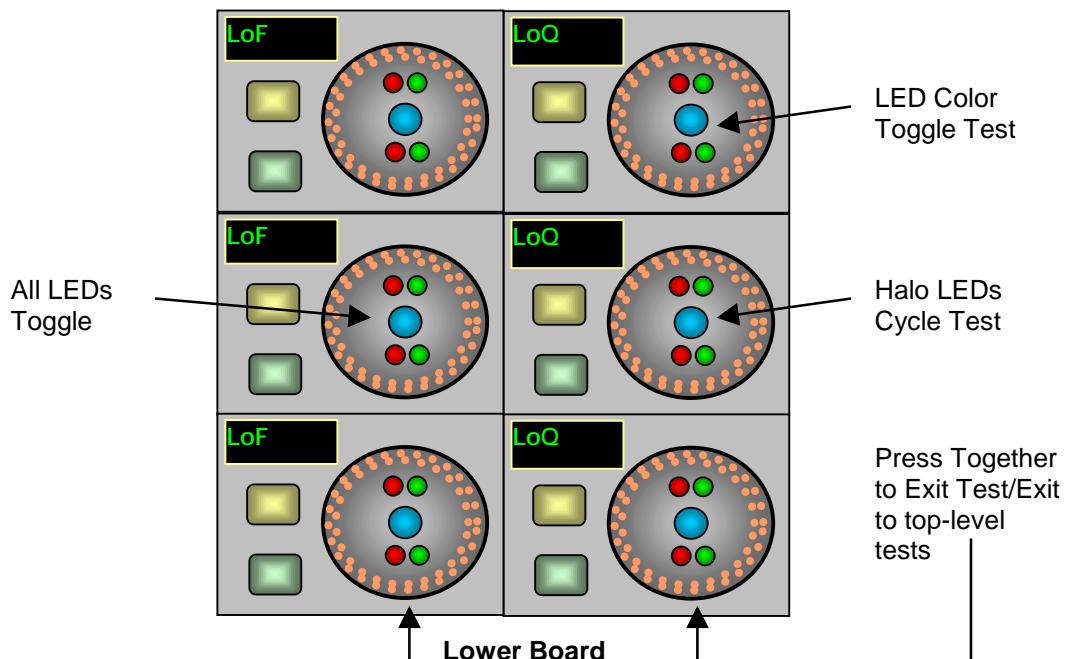
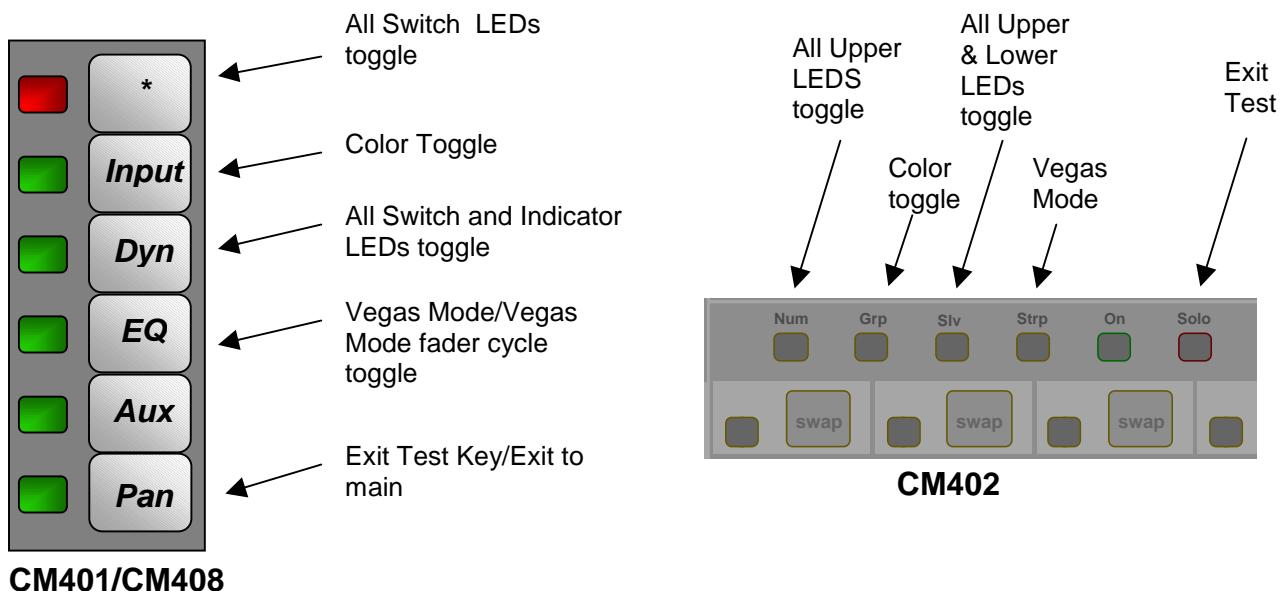
CM401/CM408



LED test

The LED test has the following modes;

- Toggle upper board LEDs
- Toggle all LEDs
- LED color test
- Vegas mode



All Switch LEDs Toggle

This switch toggles all the upper board LEDs on and off. This mode times out after 5 mins if all LEDs are left ON and goes into Vegas mode.

Color Toggle

This switch cycles between the same color LEDs in the following order

- Green
- Red
- Yellow
- Orange
- Blue

All Switch and Indicator LEDs Toggle

This toggles all the upper and lower board LEDs including the daughter board LEDs.

NOTE: For thermal reasons, the module should not be left with all LEDs On. Use Vegas mode for burn-in. For protection, the module will time out into Vegas mode if all LEDs are left ON for more than 5 minutes.

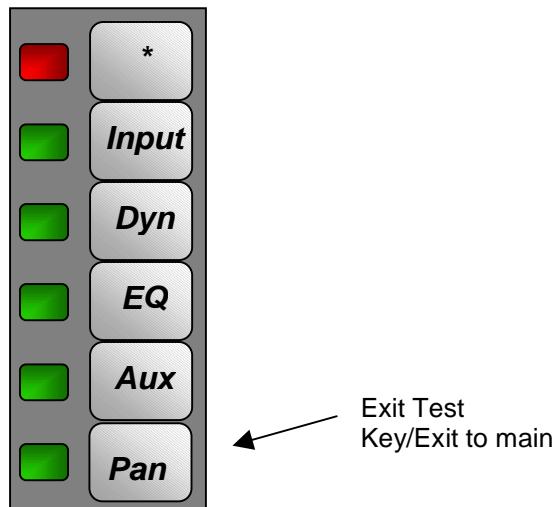
Vegas Mode

Flashes alternate LEDs on and off. The default Vegas mode also puts the fader into cycle test. Repeated presses of this key toggles the fader cycle on/off. If left running, the fader cycle will time out after 5 minutes.

Switch Test

Switch test has the following modes;

Momentary switch press - This tests lights up the switch LED of a switch while it is pressed.



CM402/CM408

Exit Test



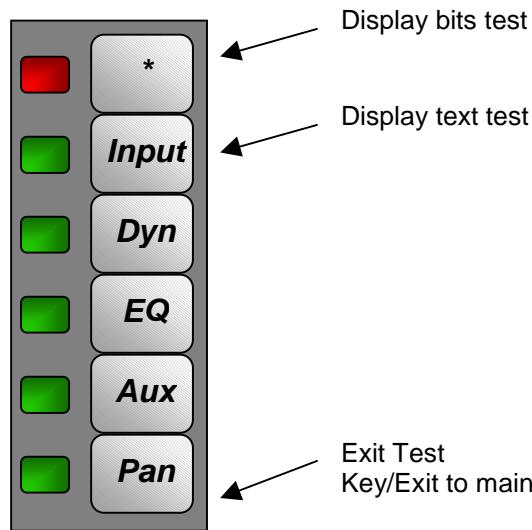
CM402

Intelligent Display Test

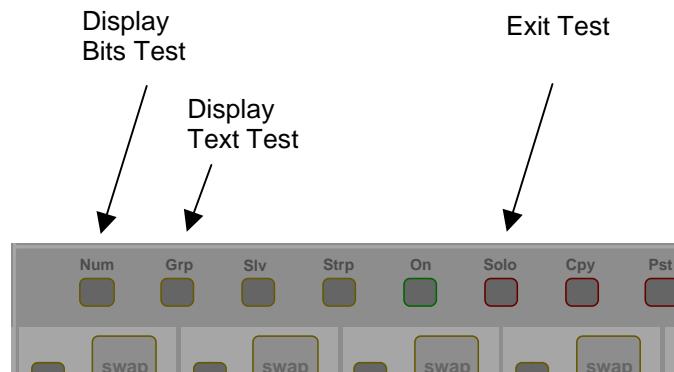
Display bit test – This test lights up the whole of the intelligent display. It dims the displays for the duration of this test to protect them from overheating and burnout.

Display text - This test shows a text on each intelligent display, which happens to be the hexadecimal display number in the software map.

This test is not accessible from the lower board.



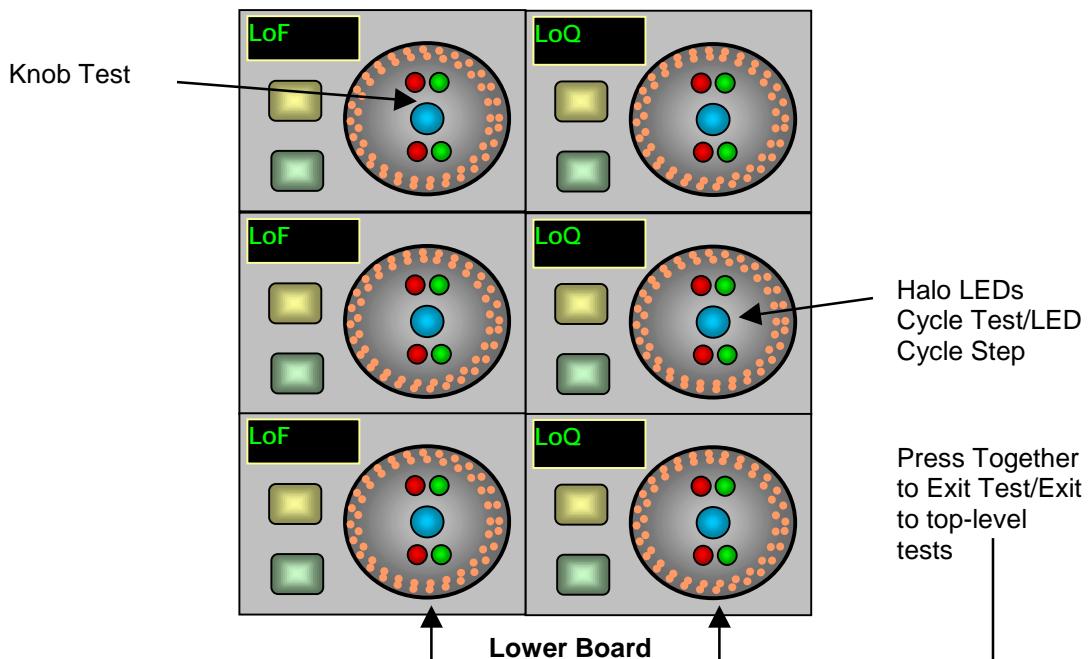
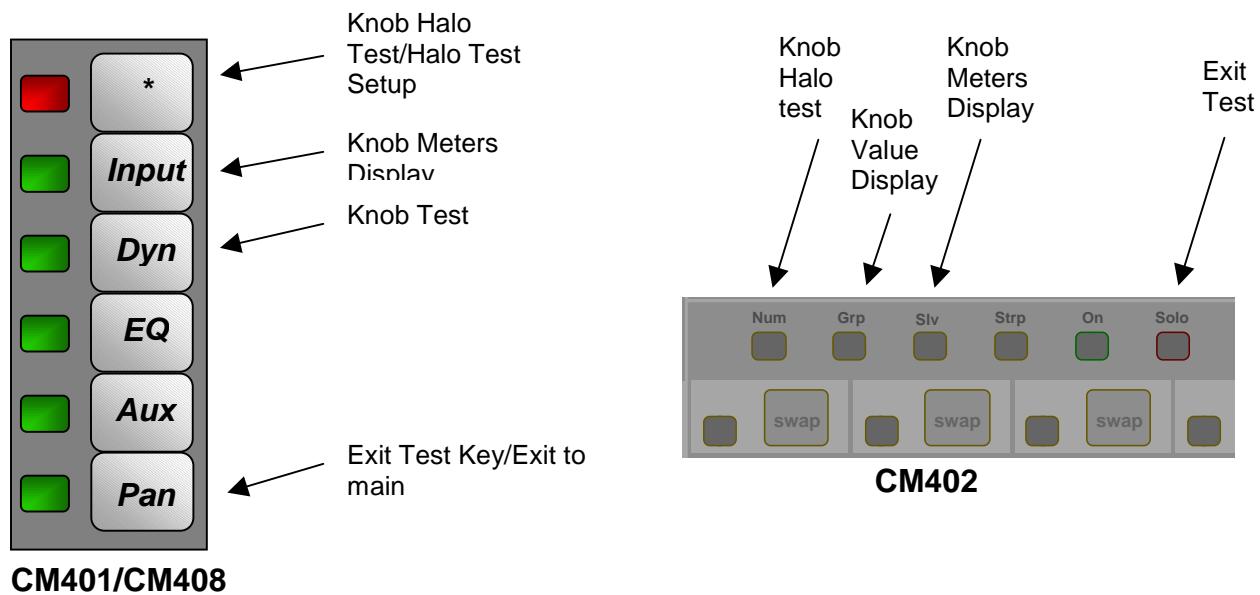
CM402/CM408



CM40

Knob Test

- Halo Test
- Knob value display
- Knob meter display
- Knob switch test
- Expansion port switch test



Knob value display

Displays the hex 0 through FF value of the knob being currently moved on an intelligent display. This mode is useful for testing the CM401 spin knob.

Halo Test

This cycles through all the knob halo and center LEDs by turning one LED on at a time on each key press.

Knob meter display

Shows the knob value as a bar on the meter board (fader daughter board).

Knob switch test

All the knobs halo orange LEDs light up while the knob center switch is pressed. The Expansion port switches are also tested in this mode. Pressing one of the eight switches will light up its LED for as long as the key is pressed.

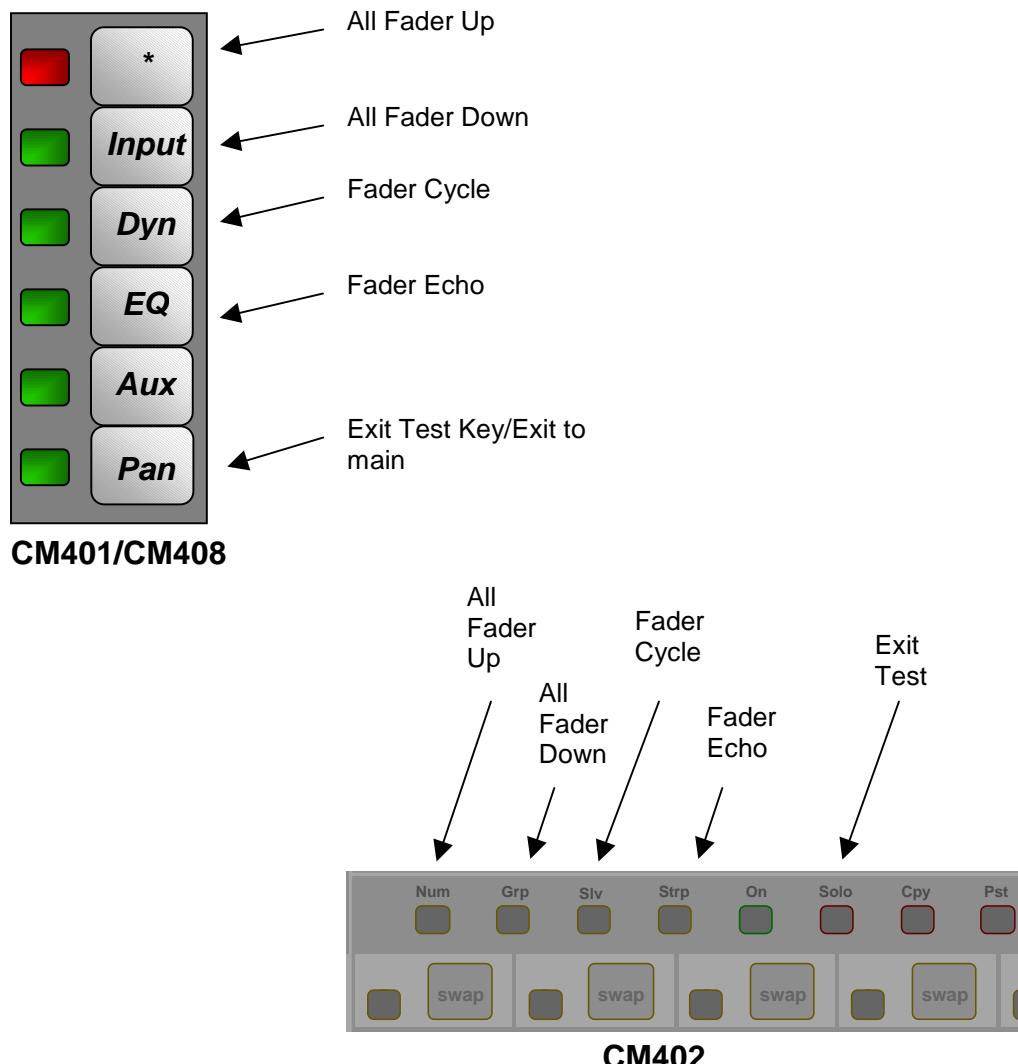
Expansion port switch test

See the Knob switch test section.

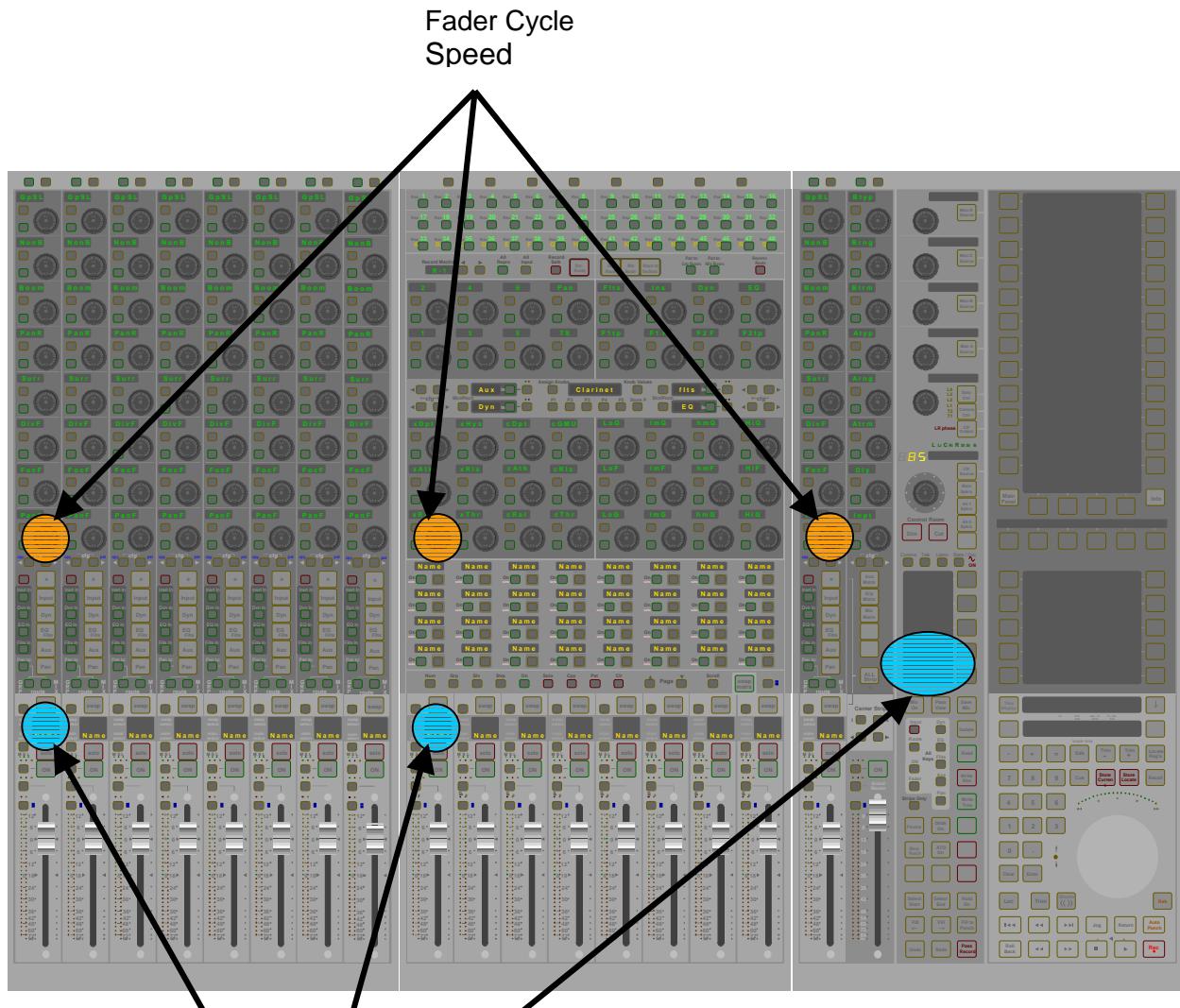
Fader Test

- All fader up
- All fader down
- Fader cycle test with speed control
- Fader echo test
- Touch Sense Test
- Backstop PFL switch test
- Fader Write value display
- Fader Read value display
- TFT backlight brightness test

This test is not accessible from the lower board.



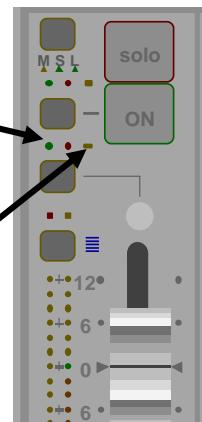
Fader Test (continued)



Fader Read/Write Value Display
 Upper Display = Read Value
 Lower Display = Write Value

Backstop
 PFL switch
 LED

Touch Sense
 LED



All fader up

All faders all the way up

All fader down

All faders all the way down

Fader cycle test with speed control

All faders cycle up and down at the speed determined by the speed control knob. The speed control knob also varies the brightness of the TFT backlight when in this test. It should vary from all the way off to the brightest setting. This fader cycle test times out after 5 minutes to protect the faders from burn-out.

Fader echo test

All faders follow the one fader touched.

Touch Sense Test

Self-test touch sense LED lights up when a fader is touched. This mode is always active in fader test mode.

Backstop PFL switch test

Self test backstop PFL LED lights up when a fader is pulled back to enable its backstop PFL switch. This mode is always active in fader test mode.

Fader Write value display

Any value written to a fader is displayed in its designated fader write intelligent display. This mode is always active in fader test mode.

Fader Read value display

All faders are continuously read and the read value is displayed in its designated fader read intelligent display. This mode is always active in fader test mode.

TFT backlight brightness test

See Fader cycle test.

CPU Test

RAM Test

This tests the upper unused portion of the CPU board RAM. Watch for the 'Pass' display to show up when the test is done.

ROM Test

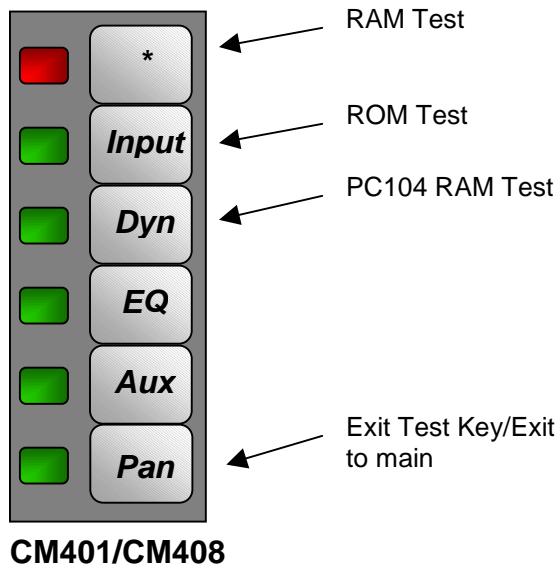
This test reads the ROM and computes and checksum and displays it. The user/tester can match the checksum to a known good checksum to make sure ROM test is successful.

Checksum (version 1.0S):

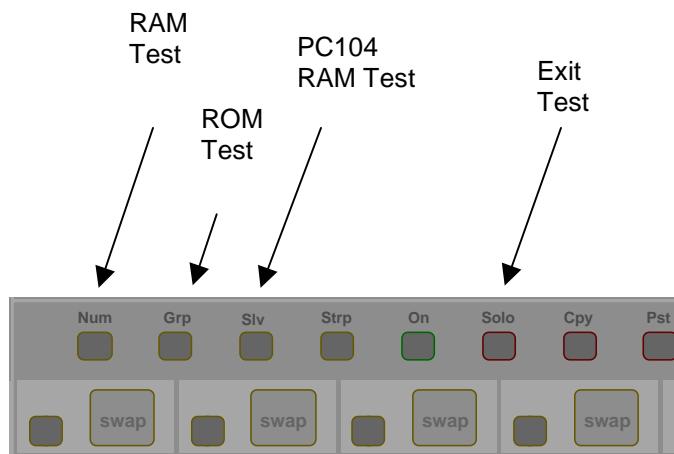
CM401	996C
CM402	33ae
CM408	C38e

PC104 RAM Test

This test writes and reads the whole PC104 RAM and checks for errors. Watch for the 'Pass' display to show up when the test is done.



CM401/CM408



APPENDIX 1

Parts Lists

System 5 Leg Set: Part# 946-07220-01		
Item#	Item Description	Qty
726-06398-01	Leg-Left-Finished S5	1
726-06846-01	Leg-Left-Machined S5	1
726-06394-01	Panel-Weldment-Left Leg	1
726-06415-01	Keyboard Tray Assy	1
726-06493-01	Track-Keyboard Top S5	1
041-06290-00	10x32x1/4 Pan/Phil/Cz	8
726-06791-01	Track-Keyboard Base S5	1
000-06790-00	Glide-Keyboard S5	2
420-04065-00	Dpdt-20a Rocker	1
600-06387-00	Iec320/C14 Power Entry	1
600-00728-00	Line Filter/Am	1
110-05551-00	Coupler Rj45 Panel Mount	12
726-06419-01	Leg-Right-Finished S5	1
726-06847-01	Leg-Right-Machined S5	1
726-06826-01	Panel-Weldment-Right	1
042-05677-00	6-32x3/16 Flat/Phil/Cirznc	14
048-00929-00	6-32x3/8 Pan/Phil/Sem-Ext/Cir	4
046-06073-00	4-40x1/4I Pan/Phil/Cir Zinc	4
726-06405-01	Bracket-Rear Caster	2
06406-01	Bracket-Front Caster	2
726-06407-01	Caster-36mm	4
726-06838-01	Spacer-Left-S5 Cm	1
044-06686-00	5/16-18x.375 Bolt Socket	8
081-06417-00	#10 Flat Washer-Brass	2
726-06832-01	Ac Cover S5	2
000-06434-00	Leveling Pad-5/16-18	4
600-06991-00	Iec320/C13 Power Outlet	3
030-06993-01	Ca-Ac Line-S5 Frame	1
030-06994-01	Ca-Ac Neutral-S5 Frame	1
030-06995-01	Ca-Ac Gnd-S5 Frame	5
030-06996-01	Ca-Outlet Ac Line-S5 Frame	1
030-06997-01	Ca-Outlet Ac Neutral-S5	1
030-06998-01	Ca-Sw Line-S5 Frame	1
030-06999-01	Ca-Sw Neutral-S5 Frame	1
006-04969-00	Label-Universal Ground	1
049-00838-00	6-32 Kepnut/Ext/Cir Zinc	12
032-07207-00	Ca-Pwr/Iec/N-Usa/8ft/15a	1
030-07199-01	Ca-Door Support-S5	4

Parts List (cont)

000-07194-00	1.5" Grommet	1
044-06686-00	5/16-18x.375 Bolt Socket	8
041-07074-00	10-24x3/8I Pan/Phil/Cz	16
041-00917-00	10-32x.125I Skt/Shldr/Ss	8
002-07316-00	Cable-Strap	1.6
726-07216-01	Kbd Palmrest-S5	1
084-00939-00	#10 Washer Ext Star/Cir Zinc	8
046-07331-00	10-32x3/8 Button/Skt/Ss	8

Parts List (cont)

System 5 Frame Set, 6ft: Part# 946-06425-01		
Item#	Item Description	Qty
726-06399-01	Beam-Box 6ft S5	2
726-06400-01	Clamp-Beam	4
726-06408-01	Beam-Back 6ft S5	1
726-06402-01	Plate-Back Beam	2
726-06403-01	Palm Rest-6ft S5	1
726-06404-01	Plate-Palm Beam	2
726-06411-01	Brace-Back	1
726-06686-01	Cover-Back 3ft	2
600-07223-00	Power Strip-lec320-6pos	2
032-07147-00	lec320 Jumper Cordset-0.5m	5
032-07148-00	lec320 Jumper Cordset-1.0m	3
032-07149-00	lec320 Jumper Cordset-1.5m	2
032-07150-00	lec320 Jumper Cordset-2.5m	1
081-07193-00	3/8 Flat/Wash/Ss	8
936-07218-01	S5 Frame Bolt Kit	1
043-06688-00	5/16-18x3.5 Bolt Hex-Head-Zi	16
082-06689-00	5/16 Lockwasher	16
046-06401-00	5/16-18x2.25 Bolt Flat/Soc/Ss	8
046-06421-00	3/8-16x1.25l Buttonhd/Skt/Ss	8
081-07193-00	3/8 Flat/Wash/Ss	8
936-07241-01	S5 Rear Panel Bolt Kit	1
044-07236-00	1/4-20x3/8 B4cs	20
936-07239-01	S5 Tee Hardware Kit	1
000-06690-00	5/16-18x.375 Tee Nut/Cz	22
044-06686-00	5/16-18x.375 Bolt Socket Hd/Cz	22
936-07240-01	S5 Thumb Screw Kit	7
040-06833-00	10-32x3/8 Thumb\Washer Face	4
030-07394-01	Ca-Internal Ethernet/6ft	1

Parts List (cont)

System 5 Frame Set, 9ft: Part# 946-06840-01		
Item#	Item Description	Qty
726-06437-01	Beam-Box 9ft S5	2
726-06400-01	Clamp-Beam	4
726-06439-01	Beam-Back 9ft S5	1
726-06402-01	Plate-Back Beam	2
726-07168-01	Palm Rest-9ft S5	1
726-06404-01	Plate-Palm Beam	2
726-06411-01	Brace-Back	2
726-06686-01	Cover-Back 3ft	3
600-07223-00	Power Strip-lec320-Reworked	2
032-07147-00	lec320 Jumper Cordset-0.5m	5
032-07148-00	lec320 Jumper Cordset-1.0m	3
032-07149-00	lec320 Jumper Cordset-1.5m	2
032-07150-00	lec320 Jumper Cordset-2.5m	1
030-07180-01	Ca-Internal Ethernet/9ft	1
936-07218-01	S5 Frame Bolt Kit	1
043-06688-00	5/16-18x3.5 Bolt Hex-Head-Zi	16
082-06689-00	5/16 Lockwasher	16
046-06401-00	5/16-18x2.25 Bolt Flat/Soc/Ss	8
046-06421-00	3/8-16x1.25I Buttonhd/Skt/Ss	8
081-07193-00	3/8 Flat/Wash/Ss	8
936-07241-01	S5 Rear Panel Bolt Kit	1
044-07236-00	1/4-20x3/8 B4cs	20
936-07239-01	S5 Tee Hardware Kit	1
000-06690-00	5/16-18x.375 Tee Nut/Cz	22
044-06686-00	5/16-18x.375 Bolt Socket Hd/Cz	22
936-07240-01	S5 Thumb Screw Kit	10
040-06833-00	10-32x3/8 Thumb\Washer Face	4

Parts List (cont)

System 5 Frame Set, 12ft: Part# 946-07160-01		
Item#	Item Description	Qty
726-07164-01	Beam-Box-12ft S5	2
726-06400-01	Clamp-Beam	4
726-07163-01	Beam-Back-12ft S5	1
726-06402-01	Plate-Back Beam	2
726-07162-01	Palm Rest-12ft S5	1
726-06404-01	Plate-Palm Beam	2
726-06411-01	Brace-Back	3
726-06686-01	Cover-Back 3ft	4
600-07223-00	Power Strip-lec320-6pos	3
032-07147-00	lec320 Jumper Cordset-0.5m	5
032-07148-00	lec320 Jumper Cordset-1.0m	3
032-07149-00	lec320 Jumper Cordset-1.5m	2
032-07150-00	lec320 Jumper Cordset-2.5m	1
936-07218-00	S5 Frame Bolt Kit	1
043-06688-00	5/16-18x3.5 Bolt Hex-Head-Zi	16
082-06689-00	5/16 Lockwasher	16
046-06401-00	5/16-18x2.25 Bolt Flat/Soc/Ss	8
046-06421-00	3/8-16x1.25I Buttonhd/Skt/Ss	8
081-07193-00	3/8 Flat/Wash/Ss	8
936-07241-01	S5 Rear Panel Bolt Kit	1
044-07236-00	1/4-20x3/8 B4cs	20
936-07239-01	S5 Tee Hardware Kit	1
000-06690-00	5/16-18x.375 Tee Nut/Cz	22
044-06686-00	5/16-18x.375 Bolt Socket Hd/Cz	22
936-07240-01	S5 Thumb Screw Kit	13
040-06833-00	10-32x3/8 Thumb\Washer Face	4
936-07237-01	S5 Aux Leg Kit	1
726-06416-01	Leg-Auxiliary S5	1
000-06434-00	Leveling Pad-5/16-18	2
000-06690-00	5/16-18x.375 Tee Nut/Cz	8
044-07192-00	5/16-18x.50 Bolt Socket Hd	8
030-07395-01	Ca-Internal Ethernet/12ft	1